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## EMERGENCY ROOF DETACHMENT DEVICE FOR A VEHICLE

### FIELD OF THE INVENTION

This invention relates generally to safety devices for vehicles and, more specifically, to an emergency roof detachment device for a vehicle dimensioned to allow a driver or another person to detach substantially the entire roof portion of the vehicle from the body of the vehicle in the event that the vehicle's occupants are trapped and unable to use other means, such as the vehicle's doors, to escape a disabled vehicle.

### BACKGROUND OF THE INVENTION

Over 40,000 people die every year in road accidents in the United States. Many victims of car crashes are not killed instantly but rather succumb to their wounds at a later time. Often, the delay in receiving life-saving medical care is a contributing cause to the death. Occasionally, medical personnel arrive on the scene to treat the victims of car accidents, but are unable to reach the victims because they are trapped in a badly damaged vehicle. In side-impact collisions especially, the side doors of a vehicle are often crushed, rendering them unusable.

It is often the case that in order to dispense life-saving medical treatment, the occupants of a vehicle must first be extricated from the damaged vehicle. In the event that the doors of the vehicle have been disabled, or the vehicle is on its side, blocking the doors closest to the vehicle's occupants, another

way must be found to remove the victims of a car crash.

Currently, emergency medical personnel must wait precious amounts of time for fire department or other rescue services to arrive with hydraulic tools, such as cutters, spreaders, rams, "Jaws of Life" and the like, in order to cut the vehicle open. These piston-rod hydraulic tools as well as other tools often require electricity, are heavy, and very expensive. The result is that it is time-consuming and often impossible to employ such devices, and the result is that lives are lost.

Much of the time, cutting tools are used to cut open the roof of a vehicle, since this is often the largest and easiest area of a vehicle to get to. The roof of a vehicle, when removed, also provides the easiest access to the vehicle's occupants.

Occasionally, after an accident, a person is not badly injured, but is nevertheless unable to extricate himself or herself through the damaged doors of a vehicle. This predicament often results in death when the car catches on fire, and the trapped occupant either suffocates or is burned to death.

Several attempts have been made to solve this problem with various kinds of vehicle hatches. All such inventions provide relatively small hatches, however, allowing only room enough for a single person to exit the vehicle at any one time.

Additionally, depending on the type of accident, the placement of the relatively small escape hatch may prevent passengers trapped in the backseat of the vehicle from utilizing the hatch in order to exit the vehicle.

For example, U.S. Patent 4,495,731 issued to Sears shows an outwardly opening hatch that is hinged to the roof of a vehicle. This design poses several problems. Due to the relatively small size of the hatch, in the event that more than one person is in the vehicle, the delay caused by waiting for others to exit the hatch may result in death or serious injury, especially in the event that the vehicle catches on fire. Additionally, the hinges prevent detachment of the hatch, leaving the hatch in the area of the roof, which can often be an obstacle to removing a person from a vehicle. European Patent Application 89201170.1 also shows a relatively small, hinged escape hatch for a vehicle. Japanese Patent 4-212626 shows an escape hatch that is not hinged, but suffers from the same size limitations of the other prior art. In all of the prior art references, if the relatively small hatch area of the roof is damaged, which can occur in a rollover accident, it is possible that the hatch may be unusable.

A need therefore existed for an emergency roof detachment device for a vehicle having a detachable roof portion that comprises substantially the entire roof of a vehicle and is therefore capable of providing all of the occupants of a vehicle with the ability to easily escape from a disabled vehicle by initiating detachment of the detachable roof portion of a vehicle.

#### SUMMARY OF THE INVENTION

An object of the present invention is to provide an emergency roof detachment device for a vehicle capable of

detaching a detachable roof portion of a vehicle in order to facilitate the exit of one or more occupants from the vehicle.

It is a further object of the present invention to provide a method for exiting a vehicle capable of allowing one or more persons the ability to detach a detachable roof portion of a vehicle in order to exit the vehicle.

#### BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS

In accordance with one embodiment of the present invention, an emergency roof detachment device for a vehicle is disclosed, comprising, in combination, a detachable roof portion dimensioned to be detachably coupled to a fixed top portion of a vehicle, the front end of the detachable roof portion being detachably coupled to the fixed top portion of the vehicle proximate a top portion of a front windshield and the back end of the detachable roof portion being detachably coupled to the fixed top portion of the vehicle proximate a top portion of a rear windshield, and a handle coupled to an interior portion of the vehicle and dimensioned to initiate detachment of the detachable roof portion from the fixed top portion of the vehicle.

In accordance with another embodiment of the present invention, a method for exiting a vehicle is disclosed comprising, in combination, the steps of providing a detachable roof portion dimensioned to be detachably coupled to a fixed top portion of a vehicle, the front end of the detachable roof portion being detachably coupled to the fixed top portion of the vehicle proximate a top portion of a front windshield and the

back end of the detachable roof portion being detachably coupled to the fixed top portion of the vehicle proximate a top portion of a rear windshield, providing a handle coupled to an interior portion of the vehicle and dimensioned to initiate detachment of the detachable roof portion from the fixed top portion of the vehicle, and initiating detachment of the detachable roof portion from the fixed top portion, and a person exiting the vehicle.

The foregoing and other objects, features, and advantages of the invention will be apparent from the following, more particular description of the preferred embodiments of the invention, as illustrated in the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the preferred embodiment of the emergency roof detachment device for a vehicle of the present invention.

Figure 2 is a side view of the detachable roof portion of the emergency roof detachment device of Figure 1.

Figure 3 is a side, cross-sectional view of the handle of Figure 1 used to initiate detachment of the detachable roof portion from the fixed top portion of the vehicle.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figure 1, reference number 10 refers generally to the preferred embodiment of the emergency roof detachment device for a vehicle of the present invention. The emergency roof detachment device 10 comprises a detachable roof portion 12 having a front end 13 and a back end 15 and is dimensioned to be detachably coupled to a fixed top portion 14 of a vehicle 16. The front end 13 of the detachable roof portion 12 is detachably coupled to the fixed top portion 14 of the vehicle 16 proximate a top portion of a front windshield 24 (shown in Figure 2). The back end 15 of the detachable roof portion 12 is detachably coupled to the fixed top portion 14 of the vehicle 16 proximate a top portion of a rear windshield 28.

In the preferred embodiment, the detachable roof portion 12 comprises substantially the entire roof of a vehicle 16, however, it should be clearly understood that substantial benefit could be derived from an alternative embodiment of the emergency roof detachment device 10 in which the detachable roof portion 12 does not comprise substantially the entire roof of a vehicle 16, such as in a long, strip-like configuration, so long as at least a portion of the front end 13 of the detachable roof portion 12 is coupled to the fixed top portion 14 of the vehicle 16 proximate a top portion of the front windshield 24 and at least a portion of the back end 15 of the detachable roof portion 12 is coupled to the fixed top portion 14 proximate a top portion of the rear windshield 28.

In the preferred embodiment, the detachable roof portion 12 is rectangular-shaped, although it should be clearly understood that substantial benefit could be derived from an alternative configuration of the emergency roof detachment device 10 in which the detachable roof portion 12 had a different shape, so long as at least a portion of the front end 13 of the detachable roof portion 12 is coupled to the fixed top portion 14 of the vehicle 16 proximate a top portion of the front windshield 24 and at least a portion of the back end 15 of the detachable roof portion 12 is coupled to the fixed top portion 14 proximate a top portion of the rear windshield 28.

Preferably, the detachable roof portion 12 comprises a plurality of prong members 30, preferably protruding out of the back end 15 of the detachable roof portion 12, dimensioned to engage corresponding recessed portions 32 (shown in Figure 2) in the fixed top portion 14, preferably proximate the rear windshield 28, of the vehicle 16. While, in the preferred embodiment, a plurality of prongs 30 and corresponding recessed portions 32 are used to couple the detachable roof portion 12 to the fixed top portion 14, it should be clearly understood that substantial benefit could be derived from an alternative embodiment of the emergency roof detachment device 10 in which the detachable roof portion 12 is coupled to the fixed top portion 14 in a different way, so long as the detachable roof portion 12 can be easily detached from the fixed top portion 14 by a person.



Referring now to Figures 2-3, the emergency roof detachment device 10 further comprises a handle 18. The handle 18 is coupled to an interior portion 20 (shown in Figure 1) of the vehicle 16 and dimensioned to initiate detachment of the detachable roof portion 12 from the fixed top portion 14 of the vehicle 16.

In the preferred embodiment, the handle 18 comprises a quick-release mechanism 19. The quick-release mechanism 19 allows the handle 18 to easily, and quickly initiate detachment of the detachable roof portion 12 from the fixed top portion 14. While, in the preferred embodiment, the handle 18 comprises a quick-release mechanism 19, it should be clearly understood that substantial benefit could be derived from an alternative embodiment of the emergency roof detachment device 10 which lacks a quick-release mechanism 19, so long as the handle 18 can be used to initiate detachment of the detachable roof portion 12 from the fixed top portion 14.

Still referring to Figures 2-3, the handle 18 preferably comprises a gripping portion 27 dimensioned to be gripped by a person (not shown) and a coupling member 29 dimensioned to couple the detachable roof portion 12 to the fixed top portion 14 of the vehicle 16. In the preferred embodiment, the coupling member 29 comprises a jaw-type member 31 dimensioned to engage a corresponding indentation 34 (shown in Figure 3) in the fixed top portion 14 of the vehicle 16. While, in the preferred embodiment, the handle 18 comprises a gripping portion 27 and a coupling member 29 having a jaw-type member 31 dimensioned to

engage a corresponding indentation 34 in the fixed top portion 14 of the vehicle 16, it should be clearly understood that substantial benefit could be derived from an alternative embodiment of the handle 18 that lacks some or all of these features, so long as the handle 18 is capable of initiating detachment of the detachable roof portion 12 from the fixed top portion 14 of the vehicle 16.

#### Statement of Operation

In order to operate the emergency roof detachment device 10, a vehicle 16 must be fitted with a detachable roof portion 12 that can be detachably coupled to a fixed top portion 14 of a vehicle 16. The front end 13 of the detachable roof portion 12 is detachably coupled to the fixed top portion 14 of the vehicle proximate a top portion of the front windshield 24 and the back end 15 of the detachable roof portion 12 is detachably coupled to the fixed top portion 14 of the vehicle proximate a top portion of the rear windshield 28. This step may be done at a manufacturing stage. Once the detachable roof portion 12 is installed and the handle 18 is coupled to an interior portion of the vehicle 16, then one must simply use the handle, preferably by pulling, to initiate detachment of the detachable roof portion 12 from the fixed top portion 14 of the vehicle 16. The person using the handle 18 to initiate detachment of the detachable roof portion 12 of the emergency roof detachment device 10 may be either one of the occupants of the vehicle 16 or some other

person reaching into the vehicle 16 in order to facilitate the exit of the occupant from the vehicle 16.

While the invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that the foregoing and other changes in form and details may be made therein without departing from the spirit and scope of the invention.